

AGILENT TECHNOLOGIES, INC.  
Legal Department, DL429  
Intellectual Property Administration  
P. O. Box 7599  
Loveland, Colorado 80537-0599



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Inventor(s): Carol T. Schembri

Serial No.: 10/037,757

Examiner: Betty J. Forman

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Group Art Unit: 1634

Title: CHEMICAL ARRAYS

COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria VA 22313-1450

TRANSMITTAL OF REPLY BRIEF

Sir:

Transmitted herewith is the Reply Brief with respect to the Examiner's Answer mailed on February 26, 2007. This Reply Brief is being filed pursuant to 37 CFR 1.193(b) within two months of the date of the Examiner's Answer.

(Note: Extensions of time are not allowed under 37 CFR 1.136(a))

(Note: Failure to file a Reply Brief will result in dismissal of the Appeal as to the claims made subject to an expressly stated new grounds of rejection.)

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Typed Name: Sandra D. Hunter

Signature: 

Respectfully submitted,

Carol T. Schembri

By 

Bret E. Field for John Brady  
Attorney/Agent for Applicant(s)

Reg. No. 37,620

Date: April 26, 2007

Telephone No. (408) 553-3584



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|---|----------------------|-------------------|
| <b>REPLY BRIEF</b><br><br>Address to:<br>Commissioner for Patents<br>P.O. Box 1450<br>Alexandria, VA 22313-1450 | Application Number   | 10/037,757        |
|   | Confirmation Number  | 7503              |
|   | Attorney Docket No.  | 10004108-1        |
|   | Filing Date          | October 18, 2001  |
|   | First Named Inventor | Carol T. Schembri |
|   | Examiner             | Betty J. Forman   |
|   | Group Art            | 1634              |
| Title: <i>CHEMICAL ARRAYS</i>   |                      |                   |

Sir:

This Reply Brief is filed in response to the Examiner's Answer mailed by the Office on February 26, 2007. This Reply Brief is filed in order to reinstate the appeal and address the new grounds of rejection raised in the Examiner's Answer.

Please charge any required fees to Deposit Account No. 50-1078, order number 10004108-1.

## REPLY BRIEF

In this Reply Brief, the Appellants address several issues raised in the Examiner's Answer. The Appellants note that all arguments presented in the prior Appeal Brief still apply with equal force, but are not reiterated here solely in the interest of brevity and for the convenience of the Board.

In this Reply Brief, the Appellants address specific assertions made by the Examiner in responding to Appellants' arguments. The Examiner's assertions are addressed in 11 sections below, each section representing a separate and independent reason why the remaining rejections should be withdrawn. The first section addresses the rejection under 35 U.S.C. §112, first paragraph, and the subsequent 10 sections address the rejections under 35 U.S.C. §103(a), including the new grounds of rejection of Claims 7 and 18 over the Giaever and Dickenson references.

### **I. Rejection under 35 U.S.C. §112, first paragraph**

*A continuous glass layer is amply supported by the specification*

As discussed in the Appeal Brief, the claims are directed to an array assembly that includes a plastic base layer, a continuous glass layer forward of the base layer, an array of polymers having a pattern of features on a front surface of the glass layer, and a layer between the base and glass layers that blocks at least 10% of an illuminating light incident on the front surface from reaching the plastic base layer, where the array assembly is flexible.

The claims are rejected under 35 U.S.C. §112, first paragraph as assertedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The Appellants argued in the Appeal Brief of May 10, 2006 that the specification teaches that the further layer may be a glass substrate and that the substrate may be a web. Because the substrate may be glass and because the substrate may be a web,

the substrate may therefore be a glass web. Accordingly, because the substrate may be a glass web, it by definition may be long and continuous.

In responding to Appellants' arguments, the Examiner notes that the cited paragraphs are refer to numbered paragraphs, which numbering is not present in the specification. The Appellants note that the Examiner's assumption that the paragraph numbers refer to the paragraph numbering of the pre-grant publication is correct. To clarify the record, the passages referred to as paragraphs 0013 and 0036 are, respectively, page 5, lines 7-12 and page 9, lines 3-5 of the specification.

On lines 16-20 of page 4 of the Examiner's Answer, the Examiner asserts that neither passage cited by the Appellants individually names "a continuous glass layer." The Examiner further asserts that the cited Figure 1 of the specification, although plainly showing an elongated substrate with multiple arrays, likewise does not define a continuous glass layer.

The Appellants submit that the Examiner has not addressed the plain meaning of the cited passages when taken in combination, as would one of skill in the art when reading the instant specification.

The Examiner states that page 9, lines 3-5, which defines a web as a long continuous piece of substrate material having a length greater than a width, "merely defines one example of a substrate." On this basis, the Examiner appears to argue that because the claimed continuous glass substrate is one species of, but does not exhaust the category "web" when so defined, that one of skill in the relevant art would not be able to ascertain that the specification includes a description of a continuous glass substrate.

However, the artisan is not reading page 9, lines 3-5 in a vacuum, but reads it in the context of page 5, lines 7-12, which clearly and unambiguously states that the claimed array can be constructed on a glass substrate. The ordinarily skilled artisan further encounters Figure 1, showing "an array assembly in the form of a web carrying multiple arrays" (legend of Figure 1 at page 5, lines 11-12 of the specification) in the context of both of the cited passages.

As such, the Examiner's argument amounts to an assertion that one of ordinary skill in the relevant art would, upon reading the disclosure containing the

cited passages and figure, be unable reasonably to discern that the disclosed apparatus can be constructed on a glass substrate.

In light of the fact that the instant specification (a) plainly states that a web references a long continuous piece of substrate, (b) provides an illustration of a long, continuous web bearing arrays on a substrate and (c) plainly states that glass is a substrate suitable for the invention, the Appellants submit that the Examiner's reasoning in making this rejection is not based in a fair and reasonable reading of the instant disclosure as it would be read one of ordinary skill in the art.

Thus, the Appellants' prior arguments still stand with equal force. The Appellants submit that the use of the term "continuous" with reference to the glass layer is fully supported by the specification as originally filed, and therefore does not constitute new matter. Accordingly, the Appellants respectfully request the reversal of the 35 U.S.C. § 112, first paragraph rejection.

## **II. Rejections under 35 U.S.C. §103(a)**

The claims are rejected under 35 U.S.C. §103(a) as allegedly rendered obvious over Chen et al. (U.S. Publication No. 2001/0051714) in view of Giaever (U.S. Patent No. 3,979,184) or Dickinson (WO Publication No. 01/18524).

*Group I: Claims 1-2, 10, 13-14, 20 and 24 - There is no motivation to modify Chen et al. in view of Giaever or Dickinson*

As discussed in the Appeal Brief, the claims of this group are directed to a flexible array assembly and a method of fabricating the flexible array assembly wherein the array assembly includes a plastic base layer, a continuous glass layer forward of the base layer, an array of polymers having a pattern of features on a front surface of the glass layer and a layer between the base and glass layers that blocks at least 10% of an illuminating light incident on the front surface from reaching the plastic base layer.

In maintaining this rejection, the Office asserts that Chen discloses a flexible array assembly that includes a plastic base layer, a glass layer and a metallic material layer in between the base layer and the glass layer. The Office acknowledges that Chen does not teach the light blocking properties of the metallic

layer, for which element the Office relies on Giaever or Dickinson.

The Appellants argued in the Appeal Brief of May 10, 2006 that there is no motivation to combine the cited references in the manner suggested by the Office because the properties for which the Office uses as a motivation to combine the references are not due to the presence of a light blocking layer in-between a plastic base and glass layer, as asserted by the Office, but are instead due to unrelated design features of the respective inventions (e.g., a metal globule layer in the case of Giaever, or microspheres in the case of Dickinson).

On lines 9-15 of page 4 of the Examiner's Answer, the Examiner acknowledges that, as argued by the Appellants, Giaever specifically teaches that the combination of the first metal surface, the dielectric layer and the second layer of metal (i.e. metal globules) produces very good interference colors from visible light.

The Examiner asserts, however, that since Giaever teaches that the precise mechanism of producing good interference is not known, the Appellants' argument that the metal globules play a role in producing the good interference benefit is invalid.

The Appellants respectfully submit that the Examiner's position serves merely to strengthen the Appellants' argument. Specifically, the Examiner bases this rejection upon the assertion that one of skill would be motivated to combine Chen et al. with the first metal layer of Giaever for the expected benefit of obtaining good interference colors from visible light. The Appellants argued in the Appeal Brief that one of skill would not be so motivated, because Giaever does not teach that the first metal layer provides such benefit, but instead teaches that the whole assembly, including the second metal globule layer, produces the benefit. The Examiner has responded by concurring that Giaever teaches that the assembly produces the expected benefit, and adding that the mechanism is unknown.

The Appellants submit that, since it is uncontested (a) that Giaever teaches that the full assembly of layers, including the second layer of metal globules, produces the benefit of good interference and (b) that it does so by an unknown mechanism, the ordinarily skilled artisan would not be motivated to modify Chen in view of Giaever in the manner suggested by the Office since Chen does not include a metal globule layer and thus would not be expected to obtain the benefit taught by



Giaever.

With regard to Chen et al. in view of Dickenson, on page 10, line 21 through page 11, line 2 of the Examiner's Answer, the Examiner asserts that the reference teaches that the metal layer of Dickenson alone is responsible for the increased efficiency of signal collection obtained by the Dickenson apparatus.

The Appellants reiterate and emphasize that Dickenson specifically teaches that "the optical signal of the bead itself is reflected thereby increasing the signal of the bead(s)" (Dickenson, page 11, lines 19-20). Accordingly, it is the interaction of the beads, not a continuous glass layer as claimed, with the other layers that provides for the beneficial property and not the mere presence of the metal coating.

The Appellants maintain that one of skill in the art would not be motivated to modify Chen in view of Dickinson in the manner suggested by the Office because the asserted motivating benefit is attributable to glass microspheres, a structure absent from the Chen et al. disclosure.

*Group II: Claims 3 and 26 - The cited references fail to teach or suggest an opaque layer between the claimed base and glass layers*

As discussed in the Appeal Brief, the claims of this group are directed to a flexible array assembly and a method of fabricating the flexible array assembly wherein the array assembly includes a plastic base layer, a continuous glass layer forward of the base layer, an array of polymers having a pattern of features on a front surface of the glass layer and an opaque layer between the base and glass layers that blocks at least 10% of an illuminating light incident on the front surface from reaching the plastic base layer.

In the Appeal Brief, in addition to the arguments detailed above for the Claims of Group I, the Appellants argued that none of the cited references teach or suggest an opaque layer between the base and glass layers.

In the Examiner's Reply, the Examiner responds that Giaever specifically teaches the non-transparent metal layer is "solid metal" (Abstract, line 3) and is "sufficiently thick so that the layer is not transparent to visible light" (Column 3, lines 22-26).

The Appellants note that the passages cited by the Examiner are referring to a possible substrate (base) material (i.e. layer 10 with a surface 11), as opposed to a “layer between the base and glass layers that blocks at least 10% of an illuminating light incident on said front surface from reaching said plastic base layer” as is claimed (please consult Giaever, column 2, lines 51-57).

The Examiner further asserts that the drawing in Figure 1 of Giaever, by presenting schematic reflecting arrows, is sufficiently detailed such that it “clearly illustrates that the non-transparent metal layer of Giaever blocks at least 10% of the light” (Examiner’s Reply, page 11, lines 18-19). The Appellants note, however, that precisely the same schematic arrows are shown “reflecting” from the metal globule layer, which is specifically described by Giaever as “a second transparent layer of a second metal” (column 2, lines 58-61). As such, the Appellants submit that the schematic arrows of Giaever’s illustration do not contain the information asserted by the Examiner.

The Examiner does not contest Appellants’ arguments with respect to Chen et al. As such, and in light of the foregoing remarks, the Appellants maintain that Chen et al. in view of Giaever or Dickinson fails to teach the limitations of Claims 3 and 26.

*Group III: Claims 4 and 15 - The cited references fail to teach or suggest a reflective layer between the claimed base and glass layers*

As noted in the Appeal Brief, the claims of this group are directed to a flexible array assembly and a method of fabricating the flexible array assembly wherein the array assembly includes a plastic base layer, a continuous glass layer forward of the base layer, an array of polymers having a pattern of features on a front surface of the glass layer and a reflective layer between the base and glass layers.

In the Appeal Brief, in addition to the arguments detailed above for the Claims of Group I, the Appellants further argued that Chen does not teach or suggest a reflective layer between the base and glass layers. Additionally, to the extent a *prima facie* case can be established with respect to Dickinson, the *prima facie* case was rebutted because Dickinson teaches away from the Appellants’ claimed



invention by teaching the use of glass microbeads to increase optical signal strength.

The Examiner responds that Dickinson does not teach that the improved signal collection is a result of the glass beads or combination of glass beads and a metal layer, but specifically teaches that the more efficient collection results from the metal layer which reflects the signal.

The Appellants reiterate and emphasize that Dickenson specifically teaches that “the optical signal of the bead itself is reflected thereby increasing the signal of the bead(s)” (Dickenson, page 11, lines 19-20). Accordingly, it is the interaction of the beads, not a continuous glass layer as claimed, with the other layers that provides for the beneficial property and not the mere presence of the metal coating.

The Examiner does not contest Appellants’ arguments with respect to Chen et al. As such, and in light of the foregoing remarks, the Appellants maintain that Chen et al. in view of Giaever or Dickinson fails to teach the limitations of Claims 4 and 15.

*Group IV: Claims 5 and 16 - The cited references fail to teach or suggest a reflective metal layer between the claimed base and glass layers*

As noted in the Appeal Brief, the claims of this group are directed to a flexible array assembly and a method of fabricating the flexible array assembly wherein the array assembly includes a plastic base layer, a continuous glass layer forward of the base layer, an array of polymers having a pattern of features on a front surface of the glass layer and a reflective metal layer between the base and glass layers.

In the Appeal Brief, in addition to the arguments detailed above for the Claims of Group I, the Appellants further argued that Chen does not teach or suggest a reflective layer between the base and glass layers.

The Examiner responds that Figure 1 of Giaever, by presenting schematic reflecting arrows, is sufficiently detailed such that it clearly depicts a reflective layer. The Appellants note, however, that the same schematic arrows are shown “reflecting” from the metal globule layer, which is specifically described by Giaever as “a second transparent layer of a second metal” (column 2, lines 58-61). As such,

the Appellants submit that the schematic arrows of Giaever's illustration do not contain the information asserted by the Examiner.

Further, Dickinson fails to teach a reflective metal layer beneath a continuous glass layer which reflects at least 10% of incident light, as claimed.

The Examiner does not contest Appellants' arguments with respect to Chen et al. As such, and in light of the foregoing remarks, the Appellants maintain that Chen et al. in view of Giaever or Dickinson fails to teach the limitations of Claims 5 and 16.

*Group V: Claims 6 and 17 – The cited references fail to teach or suggest a reflective layer between the claimed base and glass layers comprising multiple layers of dielectric materials*

As noted in the Appeal Brief, the claims of this group are directed to a flexible array assembly and a method of fabricating the flexible array assembly wherein the array assembly includes a plastic base layer, a continuous glass layer forward of the base layer, an array of polymers having a pattern of features on a front surface of the glass layer and a reflective layer between the base and glass layers comprising multiple layers of dielectric materials.

In the Appeal Brief, in addition to the arguments detailed above for the Claims of Group I, the Appellants further argued that none of the cited references teach or suggest a reflective layer between the base and glass layers comprising multiple layers of dielectric materials.

In response, the Examiner asserts that paragraph 66 of Chen et al. discloses a reflective dielectric layer and that Giaever also teaches a reflective layer including layers of dielectric materials.

The Appellants respond that, as discussed in the Appeal Brief, Chen et al. paragraph 66 fails to teach that the named metal layer is reflective. Chen et al. additionally fails to teach that the metal layer is a dielectric layer, since not all metal layers are dielectric.

The Appellants further respond that the cited passage of Giaever (column 3, lines 11-47) teaches differing materials for different layers, but does not deviate from

the plan taught by Giaever in Figure 1, which includes at most a single dielectric layer.

As such, the Appellants maintain their position that the combined references fail to teach the limitations of Claims 6 and 17.

*Group VII: Claims 12 and 22 – The cited references fail to teach or suggest an assembly in the form of an elongate web*

The claims of this group are directed to a flexible array assembly and a method of fabricating the flexible array assembly wherein the array assembly includes a plastic base layer, a continuous glass layer forward of the base layer, an array of polymers having a pattern of features on a front surface of the glass layer and a layer between the base and glass layers that blocks at least 10% of an illuminating light incident on the front surface from reaching the plastic base layer, wherein the assembly is in the form of an elongate web.

In the Appeal Brief, in addition to the arguments detailed above for the Claims of Group I, the Appellants further argued that none of the cited references teach or suggest an assembly that is in the form of an elongate web since the passage from Chen et al. cited by the Examiner fails to mention an elongated web.

In response, the Examiner asserts that the instant specification defines a “web” as a long continuous piece of substrate material having a length greater than a width.

The instant specification teaches with reference to Figures 1-3, for example, at page 11, lines 7-9, an array assembly which includes a substrate in the form of an elongated flexible web (or ribbon) 10 carrying one or more arrays 12 disposed along a front surface 11a of web 10 and separated by inter-array areas 17. The specification further teaches at lines 14-17 that it will be understood that web 10 and the embodiments to be used with it, may use any number of desired arrays 12 such as at least five, ten, twenty, fifty, or one hundred (or even at least five hundred, one thousand, or at least three thousand) arrays.

One of skill in the art therefore understands that the elongate web of the present disclosure is neither taught nor suggested in any form by Chen et al.

As such, the Appellants maintain their position that the combined references fail to teach the limitations of Claim 12 and 22.

*Group VIII: Claims 27 and 28 – The cited references fail to teach or suggest an assembly further including a bonding layer between the base layer and light blocking layer*

As discussed in the Appeal Brief, the claims of this group are directed to a flexible array assembly and a method of fabricating the flexible array assembly wherein the array assembly includes a plastic base layer, a continuous glass layer forward of the base layer, an array of polymers having a pattern of features on a front surface of the glass layer and a layer between the base and glass layers that blocks at least 10% of an illuminating light incident on the front surface from reaching the plastic base layer, wherein the assembly further includes a bonding layer between the base layer and light blocking layer.

In the Appeal Brief, in addition to the arguments detailed above for the Claims of Group I, the Appellants further argued that none of the cited references teach or suggest an assembly further including a bonding layer between the base layer and light blocking layer since both Chen et al. and Giaever as cited by the Examiner are silent with regard to this element.

In response, the Examiner asserts that Giaever is “clearly interested in adherence” of the layers, and further asserts without reference that it would have been obvious to one of skill in the art to apply an adhering layer. The Examiner acknowledges that Chen et al. is silent with regard to a bonding layer.

The Appellants respond that numerous methods which do not involve a bonding layer are available to adhere layers of an assembly such as the one disclosed, including sputtering, vacuum deposition, plasma enhanced chemical vapor deposition or other means. Indeed, Giaever’s concern with the thickness of the metal layer would be read by one of skill as implying the use of such a technique, since the use of a bonding layer presumably would relax constraints on

the thickness of the metal layer. As such, one of skill in the art would find no guidance in Chen et al., Giaever, or their combination towards arrival at the present claims.

Accordingly, the Appellants maintain their position that the combined references fail to teach the limitations of Claim 27 and 28.

### **III. Rejections under 35 U.S.C. §103(a) and New Grounds for Rejection**

*Claims 7 and 18 are not obvious over Chen et al. in view of Giaever or Dickinson*

The instant claims are directed to, *inter alia*, the assemblies of Claims 1 and 14 in which the glass layers has, respectively, a thickness of 40-200 nm or 0.40-200 nm.

Prior to the inclusion by the Examiner of the secondary references, the Appellants argued in the Appeal Brief that Chen et al. fails to teach the light blocking properties, or indeed any properties beyond material, of the metallic layer, and therefore no *prima facie* case can be made over Chen et al.

The Examiner responds in the Examiner's Reply by first reiterating that Chen et al. teaches a metal layer, and then turning to Giaever or Dickinson for the light blocking properties assertedly taught by these references.

Appellants respond that, as discussed above, Chen et al. does not describe or suggest light blocking properties of the metal layer. Further, the passages in Giaever cited by the Examiner above are referring to a possible substrate (base) material (i.e. layer 10 with a surface 11), as opposed to a "layer between the base and glass layers that blocks at least 10% of an illuminating light incident on said front surface from reaching said plastic base layer" as is claimed (please consult Giaever, column 2, lines 51-57).

The Examiner further asserts that the drawing in Figure 1 of Giaever, by presenting schematic reflecting arrows, is sufficiently detailed such that it "clearly illustrates that the non-transparent metal layer of Giaever blocks at least 10% of the

light" (Examiner's Reply, page 11, lines 18-19). The Appellants note, however, that precisely the same schematic arrows are shown "reflecting" from the metal globule layer, which is specifically described by Giaever as "a second transparent layer of a second metal" (column 2, lines 58-61). As such, the Appellants submit that the schematic arrows of Giaever's illustration do not contain the information asserted by the Examiner.

Dickinson teaches a metal layer beneath glass beads. For reasons of record, Dickinson does not remedy the deficiencies of Chen et al.

Moreover, the Examiner asserts that *In Gardner v. TEC Systems, Inc.*, applies because the claimed thicknesses of the glass layer are assertedly a dimensional difference which does not affect performance. The Appellants disagree, and submit that the art in the array field, and any field wherein optical detection is a functional element, is replete with examples of how focal length, interference, diffraction angle and reflection are functionally crucial to the methods practiced. As well, the complexity of the art is such that products and methods such as those instantly disclosed, which optimize detection by specifying dimensional parameters, do not represent mere "optimization" as asserted by the Examiner, but patentably distinct innovations.

Accordingly, the Appellants maintain their position that the combined references fail to teach the limitations of Claim 7 and 18.



## CONCLUSION

In view of the foregoing discussion, the Applicants request that all remaining rejections be reversed and that the application be remanded to the Examiner with instructions to issue a Notice of Allowance.

Respectfully submitted,

Date: April 26, 2007

By: 

Bret Field  
Registration No. 37,620

AGILENT TECHNOLOGIES, INC.  
Legal Department, DL429  
Intellectual Property Administration  
P.O. Box 7599  
Loveland, Colorado 80537-0599

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